ASTRONOMY AND ASTROPHYSICS

A European Journal

Volume 312 1996

Published by Springer on behalf of the Board of Directors

Astronomy and Astrophysics A European Journal

Board of Directors

Chairman:
A. Maeder (Switzerland)

Vice Chairman:
A.G. Hearn (The Netherlands)

D. Alloin (France)
R. Canal (Spain)
G. Contopoulos (Greece)
M. Crézé (France)
J. Einasto (Estonia)
R. Giacconi (ESO)
P. Harmanec (Czech Republic)
K. Mattila (Finland)
P.G. Mezger (Germany)
P.E. Nissen (Denmark)
C. Perola (Italy)
J. Pfleiderer (Austria)
Aa. Sandqvist (Sweden)
J.I. Smak (Poland)
P. Smeyers (Belgium)
B. Szeidl (Hungary)
R. Wielen (Germany)
J. Zverko (Slovak Republic)

Editors-in-Chief

J. Lequeux
Astronomy and Astrophysics
Editorial Office
Observatoire de Paris
61 avenue de l'Observatoire
F-75014 Paris
France

Tel. (33-1) 43290541
Fax (33-1) 43290557
e-mail: aanda@mesiob.obspm.fr (internet)
mesioa:: aanda (span)

H.J. Habing
Astronomy and Astrophysics
Editorial Office
Leiden Observatory
P.O. Box 9513
2300 RA Leiden
The Netherlands

Tel. (31) (0) 71-5275916
Fax (31) (0) 71-5275803
e-mail: aanda@strw.leidenuniv.nl

Letter Editor

S.R. Pottasch
Kapteyn Astronomical Institute
P.O. Box 800
9700 AV Groningen
The Netherlands

Tel. (31-50) 3634093
Telex (44) 53572 stars nl
Telefax (31-50) 3636100

Editorial secretaries

Miss B. Perche
Mrs. M. Rougeot

Mrs. B. Smit
Mrs. M. Wisse

Mrs. J. Zwegers-Morris

The exclusive copyright © for all languages and countries, including the right for photomechanical and any other reproduction, also in microform, is vested in European Southern Observatory (ESO).
The use of registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Springer 1996
Printed in Germany
Printing and bookbinding: Druckhaus Beltz, 69494 Hemsbach

Volume 312 1996

Contents

Letters to the Editor

V- and I-band observations of the halo of NGC 5907
Lequeux J., Fort B., Dantel-Fort M., Cuillandre J.-C., Mellier Y. L1

Magnetic fields in hot subdwarfs
Elkin V.G. L5

The X-ray lightcurve of SN 1987 A
Hasinger G., Aschenbach B., Trümper J. L9

Possible absorbing systems towards the BL Lacertae object PKS 0139–097
Heidt J., Nilsson K., Pursimo T., Takalo L.O., Sillanpää A. L13

Shell lines in 48 Librae: the discovery of narrow optical absorption components (NOACs)
Hanuschik R.W., Vrancken M. L17

Two planetary nebulae in the Sagittarius dwarf Galaxy
Zijlstra A.A., Walsh J.R. L21

Momentum transfer in the photoionization of lithium
Massacrier G., El-Murr K. L25

The mass dependence of the star formation history of disk galaxies
Gavazzi G., Scodeggio M. L29

Molecular abundances in the Magellanic Clouds. II. Deuterated species in the LMC
Chin Y.-N., Henkel C., Millar T.J., Whiteoak J.B., Mauersberger R. L33

Velocity-dependent fractionation in the solar chromosphere
Peter H. L37

Cosmology

A large-area cross-correlation study of high galactic latitude soft and hard X-ray skies
Miyaji T., Hasinger G., Egger R., Trümper J., Freyberg M.J. 1

The large-scale gravitational bias from the quasi-linear regime
Bernardeau F. 11

Time-variation of Newton's constant and the age of globular clusters
Degl'Innocenti S., Fiorentini G., Raffelt G.G., Ricci B., Weiss A. 345

The probability distribution of the Hubble constant
Amendola L. 353

Extragalactic astronomy

Spectroscopic observations of AB supergiants in M 33
Monteverde M.I., Herrero A., Lennon D.J., Kudritzki R.P. 24

The ultraviolet absorption spectrum of the $z = 2.72$ QSO HS 1700+6416. II. Sulfur and neon in heavy-element absorbing systems
Köhler S., Reimers D., Wamsteker W. 33

Globular cluster halos around dwarf elliptical galaxies
Minniti D., Meylan G., Kissler-Patig M. 49

Components of the ultraviolet continuum in active galactic nuclei
Paltani S., Walter R. 55

Excitation and temperature of extended gas in active galaxies. I. Observations
Storchi-Bergmann T., Wilson A.S., Mulchaey J.S., Binette L. 357

Excitation and temperature of extended gas in active galaxies. II. Photoionization models with matter-bounded clouds
Binette L., Wilson A.S., Storchi-Bergmann T. 365

5 GHz EVN polarization of 3C 286
Jiang D.R., Dallacasa D., Schilizzi R.T., Lüdke E., Sanghera H.S., Cotton W.D. 380

Ultraluminous infrared galaxies with no signs of interaction
Aurière M., Hecquet J., Coupinot G., Arthaud R., Mirabel I.F. 387

NGC 1569: the molecular and ionized gas near the superluminous star clusters A and B
Greve A., Becker R., Johansson L.E.B., McKeith C.D. 391

The phenomenology of disk galaxies
Gavazzi G., Pierini D., Boselli A. 397

The magnetic field in the perturbed spiral galaxy NGC 4254
Soida M., Urbanik M., Beck R. 409

Spectroscopy of bright blue objects in the field of M 81
Zickgraf F.-J., Szeifert T., Humphreys R.M. 419

M = 1 and 2 gravitational instabilities in spiral disks. I. Diffuse gas
Junqueira S., Combes F. 703

The population of galaxies in the distant clusters Cl 1613+3104 and Cl 1600+4109
Vílchez-Gómez R., Pelló R., Sanahuja B. 717

Monitoring of the VLBI radio structure of the BL Lacertae object OJ 287 from geodetic data
Vicente L., Charlot P., Sol H. 727

The structure of the quasar 3C 345 at λ 49 cm and its relation to low-frequency variability
Matveenko L.I., Pauliny-Toth I.I.K., Bååth L.B., Graham D.A., Sherwood W.A., Kus A.J. 738

The redshift-space neighborhoods of 13 SSRS groups of galaxies
Ramella M., Focardi P., Geller M.J. 745

The effects of resonance scattering and dust on the UV line spectrum of radio galaxies
Villar-Martín M., Binette L., Fosbury R.A.E. 751

Counter-rotating bars within bars
Friedli D. 761

A search for molecular absorption in the tori of active galactic nuclei
Drinkwater M.J., Combes F., Wiklind T. 771

The Sombrero galaxy. II. Colours, kinematics and line strengths of the central region
Emsellem E., Bacon R., Monnet G., Poulain P. 777

A generalized Schmidt star formation law: observational constraints. II
Caimmi R. 797

A statistical bias in the spectral index – flux correlation of AGNs
Massaro E., Trèvese D. 810

Galactic structure and dynamics

High-velocity clouds impacting onto the galactic disk. A new class of X-ray emitting objects
Kerp J., Mack K.-H., Egger R., Pietz J., Zimmer F., Mebold U., Burton W.B., Hartmann D. 67

Nonlinear variability of NGC 4151
Longo G., Vio R., Paura P., Provenzale A., Rifatto A. 424

Influence of the disc on the orbital decay of satellite galaxies
Wahde M., Donner K.J. 431

On the calibration of the B-type dwarfs
Jaschek C., Valbousquet A., Ochsenbein F. 815

Stellar clusters and associations

Proper motion study of the globular cluster M 92
Tucholke H.-J., Scholz R.-D., Brosche P. 74

The globular cluster population of low-luminosity X-ray sources
Johnston H.M., Verbunt F. 80

ROSAT survey of stellar X-ray sources in the young open cluster NGC 2516
Dachs J., Hummel W. 818

The mass function of the Pleiades down to 0.3 $M_\odot$
Meusinger H., Schilbach E., Souchay J. 833

Formation, structure and evolution of stars

(RN) The long-term X-ray lightcurve of RX J 0527.8–6954
Greiner J., Schwarz R., Hasinger G., Orio M. 88

The systemic-velocity distribution of cataclysmic variables
van Paradijs J., Augusteijn T., Stehle R. 93

Studies of the flickering in cataclysmic variables. II. The location of the flickering light source in Z Chamaeleontis
Bruch A. 97

The quiescent light curve and orbital period of GRO J0422+32
Chevalier C., Ilovaisky S.A. 105

Determination of [Fe/H] from the light curves of RR Lyrae stars
Jurcsik J., Kovács G. 111

Periodic and aperiodic variations in TT Arietis. Results from an international campaign
Tremko J., Andronov I.L., Chinarova L.L., Kumsiashvili M.I., Luthardt R., Pajdosz G., Patkós L., Röβiger S., Zola S. 121

Evolution of the post-nova GQ Mus (Nova Muscae 1983). I. A photoionization model for the shell from 1984 to 1990
Morisset C., Péquignot D. 135

Angular diameter and limb darkening of Arcturus
Quirrenbach A., Mozurkewich D., Buscher D.F., Hummel C.A., Armstrong J.T. 160

Spectral analyses of late-type WC central stars of planetary nebulae
Leuenhagen U., Hamann W.-R., Jeffery C.S. 167

New weak-line T Tauri stars in Taurus-Auriga
Wichmann R., Krautter J., Schmitt J.H.M.M., Neuhäuser R., Alcalá J.M., Zinnecker H., Wagner R.M., Mundt R., Sterzik M.F. 439

Molecular gas near HD 104237 and ε Chamaeleonis
Knee L.B.G., Prusti T. 455

Pulsation models of δ Scuti variables. I. The high-amplitude double-mode stars
Petersen J.O., Christensen-Dalsgaard J. 463

Combined stellar structure and atmosphere models for massive stars. II. Spectral evolution on the main sequence
Schaerer D., de Koter A., Schmutz W., Maeder A. 475

(RN) TU Leonis = (8) Flora: the non-existence of a U Geminorum star
Schmadel L.D., Schmeer P., Börngen F. 496

Cepheus OB3 association: faint members
Jordi C., Trullols E., Galadí-Enríquez D. 499

(RN) Irregular variations of the Maia candidate γ Coronae Borealis
Lehmann H., Scholz G., Hildebrandt G. 508

Evolution and nucleosynthesis of a 20 $M_\odot$ star, up to neon exhaustion
Aubert O., Prantzos N., Baraffe I. 845

Simultaneous intensive photometry and high resolution spectroscopy of δ Scuti stars. II. X Caeli: a star with unusual spectral features
Mantegazza L., Poretti E. 855

(RN) High speed photometry of GK Persei during the 1986 optical outburst
Pezzuto S., Bianchini A., Stagni R. 865

Accretion torques in the transient X-ray pulsar EXO 2030+375
Reynolds A.P., Parmar A.N., Stollberg M.T., Verbunt F., Roche P., Wilson R.B., Finger M.H. 872

Jet-like structures in β Lyrae. Results of optical interferometry, spectroscopy and photometry
Harmanec P., Morand F., Bonneau D., Jiang Y., Yang S., Guinan E.F., Hall D.S., Mourard D., Hadrava P., Božić H., Sterken C., Tallon-Bosc I., Walker G.A.H., McCook G.P., Vakili F., Stee P., Le Contel J.M. 879

Extragalactic symbiotic systems. IV. The supersoft X-ray source SMC 3
Jordan S., Schmutz W., Wolff B., Werner K., Mürset U. 897

A spectroscopic study of the δ Scuti star 20 Canum Venaticorum
Mathias P., Aerts C. 905

The stability of the frequency content in the light curves of the δ Scuti stars HD 16439 ≡ V 663 Cassiopeiae, AZ Canis Minoris, HD 223480 ≡ BF Phoenicis
Poretti E., Mantegazza L., Bossi M. 912

X-ray binary systems in the Small Magellanic Cloud
Kahabka P., Pietsch W. 919

Pulsars revived by gravitational waves
Lipunov V.M., Panchenko I.E. 937

MWC 314: a high-luminosity peculiar Be star
Miroshnichenko A.S. 941

Stellar atmospheres

Iron K fluorescence and Compton reflection in magnetic cataclysmic variables
van Teeseling A., Kaastra J.S., Heise J. 186

Hα line formation in hot star winds: the influence of rotation
Petrenz P., Puls J. 195

The behaviour of the excess Ca II H and K and Hε emissions in chromospherically active binaries
Montes D., Fernández-Figueroa M.J., Cornide M., De Castro E. 221

Quasi-simultaneous polarimetry and photometry of peculiar early-type stars. I. Circumstellar environment of a B[e] star: MWC 349 (= V 1478 Cygni)
Yudin R.V. 234

Circumstellar extinction of pre-main-sequence stars
Voshchinnikov N.V., Molster F.J., Thé P.S. 243

The nature of objects with a 21-μm feature
Henning T., Chan S.J., Assendorp R. 511

(RN) Optical and near-infrared photometry of the Vega-excess star SAO 26804 = HD 233517
Miroshnichenko A.S., Bergner Y.K., Kuratov K.S. 521

NLTE models for synthetic spectra of type Ia supernovae. The influence of line blocking
Pauldrach A.W.A., Duschinger M., Mazzali P.A., Puls J., Lennon M., Miller D.L. 525

Phase-locked photospheric and stellar-wind variations of θ^1 Orionis C
Stahl O., Kaufer A., Rivinius T., Szeifert T., Wolf B., Gäng T., Gummersbach C.A., Jankovics I., Kovács J., Mandel H., Pakull M.W., Peitz J. 539

On the use of Ca I triplet lines as luminosity indicators
Cayrel R., Faurobert-Scholl M., Feautrier N., Spielfiedel A., Thévenin F. 549

HD 133656: a new high-latitude supergiant
van Winckel H., Oudmaijer R.D., Trams N.R. 553

Interferometric observations of 43 and 86 GHz SiO masers in R Cassiopeiae
Colomer F., Baudry A., Graham D.A., Booth R.S., de Vicente P., Krichbaum T.P., Gómez-González J., Schalinski C. 950

Metal abundances of field RR Lyraes
Fernley J., Barnes T.G. 957

Non-LTE abundance corrections of iron and carbon in A-type and related stars
Rentzsch-Holm I. 966

Diffuse matter in space (including H II regions and planetary nebulae)

The dust/gas correlation at high Galactic latitude
Boulanger F., Abergel A., Bernard J.-P., Burton W.B., Désert F.-X., Hartmann D., Lagache G., Puget J.-L. 256

Infrared properties of isolated water ice
Ehrenfreund P., Gerakines P.A., Schutte W.A., van Hemert M.C., van Dishoeck E.F. 263

Statistics and properties of H II regions in a sample of grand-design galaxies. II. Physical properties
Rozas M., Knapen J.H., Beckman J.E. 275

The H I bubble surrounding the Wolf–Rayet star WR 149
Cappa C.E., Niemela V.S., Herbstmeier U., Koribalski B. 283

Ultraviolet processing of interstellar ice analogs. I. Pure ices
Gerakines P.A., Schutte W.A., Ehrenfreund P. 289

ROSAT observations of the W 50/SS 433 system
Brinkmann W., Aschenbach B., Kawai N. 306

The asymmetric bipolar flow in OH 231.8+4.2
Alcolea J., Bujarrabal V., Sánchez Contreras C. 560

(RN) Detection of HC_9N (J = 39–38) from CRL 2688 and CRL 618 and of NH_3 (5,4) toward CRL 618
Truong-Bach, Graham D., Nguyen-Q-Rieu 565

Dust emission from star-forming regions. IV. Dense cores in the Orion B molecular cloud
Launhardt R., Mezger P.G., Haslam C.G.T., Kreysa E., Lemke R., Sievers A., Zylka R. 569

Ammonia and $C^{18}O$ in globules
Lemme C., Wilson T.L., Tieftrunk A.R., Henkel C. 585

Chemistry in the high density molecular interface surrounding the Orion nebula
Fuente A., Rodríguez-Franco A., Martín-Pintado J. 599

A search for extinction variations related to AU-scale structure in molecular clouds
Thoraval S., Boissé P., Stark R. 973

Excitations and line profiles of CO in clumpy molecular clouds: radiative interactions of clump and interclump media
Park Y.-S., Hong S.S., Minh Y.C. 981

The structure and evolution of the dark cloud B 164 under the influence of a bright star, π^1 Cyg
Pagani L., Bréart de Boisanger C. 989

The Sun

Theoretical amplitudes of solar g-modes
Andersen B.N. 610

Solar torsional oscillations due to the magnetic quenching of the Reynolds stress
Küker M., Rüdiger G., Pipin V.V. 615

New solar models including helioseismological constraints and light-element depletion
Richard O., Vauclair S., Charbonnel C., Dziembowski W.A. 1000

The solar system

Destruction processes for dust in protoplanetary accretion disks
Duschl W.J., Gail H.-P., Tscharnuter W.M. 624

Simulation of the cometary 10 μm band by laboratory data. II. Extension to spectra available for different comets
Colangeli L., Mennella V., Rotundi A., Palumbo P., Bussoletti E. 643

Fragmentation of meteoroids and the structure of meteor coma
Novikov G.G., Pecina P., Blokhin A.V. 1012

Celestial mechanics and astrometry

Radial velocities, proper motions and the determination of the orbital structure of a spherical star cluster
Wybo M., Dejonghe H. 649

Corrections and new developments in rigid earth nutation theory. I. Lunisolar influence including indirect planetary effects
Souchay J., Kinoshita H. 1017

Comparison of the Carlsberg optical reference frame with the International Celestial Reference Frame
Argyle R.W., Einicke O.H., Pilkington J.D.H., Morrison L.V., Jones D.H.P., Fabricius C., Helmer L. 1031

Relative astrometry with Hipparcos: double stars with orbital motion
Emanuele A., Badiali M., Cardini D., Pannunzio R., Bernacca P.L. 1038

Physical and chemical processes

Enhanced inertia of thin magnetic flux tubes
Moreno-Insertis F., Schüssler M., Ferriz Mas A. 317

Waiting point approximation and canonical multi-event r-process revisited
Goriely S., Arnould M. 327

Stability of the magnetospheric boundary of a neutron star undergoing spherical accretion
Ikhsanov N.R., Pustil'nik L.A. 338

Galactic dynamos have movable boundaries
Dobler W., Poezd A.D., Shukurov A. 663

The galactic merger-rate of (ns, ns) binaries. I. Perspective for gravity-wave detectors
Portegies Zwart S.F., Spreeuw J.N. 670

Gravitational waves from pulsars: emission by the magnetic-field-induced distortion
Bonazzola S., Gourgoulhon E. 675

On the interaction of longitudinal and transversal waves in thin magnetic flux tubes
Nakariakov V.M., Zhugzhda Y.D., Ulmschneider P. 691

Abstracts of articles which have been published in A&A Supplement Series 118, No. 2 699

Studies of dense molecular cores in regions of massive star formation. IV. Multitransition CS-study towards southern H_2O masers in the longitude range $l = 308°–360°$
Juvela M. 699

Optical positions of seventeen radio stars from circumzenithal observations by the method of equal altitudes
Pešek I., Hefty J., Skoupý V. 699

Radial velocities and axial rotation for a sample of chemically peculiar stars
Levato H., Malaroda S., Morrell N., Solivella G., Grosso M. 699

The photoelectric astrolabe catalogue of Yunnan Observatory (YPAC)
Hu Hui, Li Dongming, Li Yongsheng, Wang Rui, Li Xiaoming 699

Optical observations of planetary nebula candidates from the northern hemisphere
Van de Steene G.C., Jacoby G.H., Pottasch S.R. 700

Results of the ESO-SEST Key Programme: CO in the Magellanic Clouds. V. Further CO observations of the Small Magellanic Cloud
Rubio M., Lequeux J., Boulanger F., Booth R.S., Garay G., de Graauw T., Israel F.P., Johansson L.E.B., Kutner M.L., Nyman L.-Å. 700

The astrometric accuracy of "Carte du Ciel" plates and proper motions in the field of the open cluster NGC 1647
Geffert M., Bonnefond P., Maintz G., Guibert J. 700

Elemental abundance analyses with Complejo Astronómico El Leoncito REOSC echelle spectrograms. I. κ Cancri, HR 7245, and ξ Octantis
Pintado O.I., Adelman S.J. 700

Searching for comets encountering Jupiter. Second campaign observations and further constraints on the size of the Jupiter family population
Lindgren M., Tancredi G., Lagerkvist C.-I., Hernius O. 701

Variable stars in the field of the old open cluster NGC 2243
Kaluzny J., Krzemiński W., Mazur B. 701

Kinematics of the local universe. III. Neutral hydrogen observations of southern galaxies
Di Nella H., Paturel G., Walsh A.J., Bottinelli L., Gouguenheim L., Theureau G. 701

Optical positions of 68 radio stars
Lu Lizhi, Manrique W.T., Perdomo R. 701

The MOST supernova remnant catalogue (MSC)
Whiteoak J.B.Z., Green A.J. 702

Provisional orbits for three visual binaries
Jasinta D.M.D. 702

Antarctic site testing – microthermal measurements of surface-layer seeing at the South Pole
Marks R.D., Vernin J., Azouit M., Briggs J.W., Burton M.G., Ashley M.C.B., Manigault J.F. 702

On CCD standard stars and flat-field calibration
Manfroid J. 702